

**Work Execution Plan
Monterey Bay Aquarium Research Institute
Moss Landing Ocean Bore**

Moss Landing, California

Borehole abandonment is an unlikely occurrence in Horizontal Directional Drilling. Environmental Crossings, Inc. will do everything possible for the job to be completed without the need to abandon a hole. There are three reasons a bore might need to be abandon:

- Drill pipe gets stuck inside the borehole and can't be moved forward or backward.
- Drill string breaks off during the drilling process
- Uncontrollable release of bentonite to the surface.

Stuck Drill Pipe

When drilling in a jettable formations of sands & silts, the longer the drill stem sits motionless (overnight or on week ends), the increased chance of having the formation collapse around the pipe and start to firm up.

Broken Drill String

It is possible that during the drilling procedure, the drill pipe could shear in two, leaving an un-retrievable amount of pipe in the borehole, and only being able to extract the section closest to the surface.

Uncontrollable release

Some sub-surface formation anomalies are just not suitable for holding and containing drill fluid. Corrective measures can be taken and the release is still flowing, this may require halting drill operations and switching to a new drill alignment.

Corrective Measures

If a borehole needs to be abandon for one of the scenarios listed above the same corrective measures will be taken. The accessible drill pipe will be pulled out of the borehole, as bentonite grout is pumped down through the drill stem. The bentonite grout will congeal filling the vacant cavity left behind.